

OUR CORRESPONDENCE.

TO THE EDITOR OF THE BUILDER.

SIR,—In forwarding you the following extracts, according to promise, let me premise them, by stating that I am not aware that there is any very useful general information on the subject of limes published, except in the reports of the Architectural Society; therefore, I considered the following dissertation would convey very desirable knowledge to the student upon this most important article in building. Let the reader recollect that it is taken from a work published in 1805, consequently the prices are altered, and many improvements may have taken place, but still this essay contains much valuable matter and remarks which may be of great service to the country surveyor. I make the extract from a work edited by Mr. John Phillips, Surveyor, author of a work on Inland Navigation, and Surveyor of Canals in Russia under the Empress Catherine II.

I remain yours respectfully,
OFFICINATOR.

DISSERTATION ON LIMES—THEIR PROPERTIES, AND EXPLANATION IN MAKING THEIR KILNS, AND BURNING.

"I shall give a short explanation on the nature of lime for building, and describe the qualities and uses of eight different kind of limes, viz. First, common chalk lime; second, a much harder chalk, or rather, stone lime, burnt in patent kilns, by the Right Hon. Lord Stanhope, near Bromley in Kent; third, Dorking stone lime; fourth, Guildford stone lime; fifth, shell lime; sixth, Kentish rag-stone lime; seventh, Plymouth stone lime; and, eighth, Welch stone lime, from Cardiff or Aberthaw, in Glamorganshire, and burnt into lime here.

"The first of these limes, and its uses, requires very little description, it being the lime in common use in all our ordinary, and even principal buildings; but if a little more fire and care in its burning was attended to, it would be much the better; and as the price is raised from 8s. to 12s. 6d. per hundred, within these very few years, the common chalk lime merchants could well afford to make a much better commodity, as the extra expense in labour and coals is not above 1s. 9d. per hundred; and it is further remarkable, that where the chalk and coals are procured cheapest, the lime from thence, in general, is the worst, for it is well known to those master bricklayers and plasterers, whose close attention to business has insured them success, that the lime made up at Deptford Creek, and near Lewisham, at Nine Elms, by Vauxhall, and at Chiswick, although attended with additional expense of carriage of chalk and coals, yet it is far better lime than any other made lower down the river.

"The principal matter is generally overlooked or neglected; or, perhaps, not generally known, and that is in building the kiln; whether they think the old method sufficient, or that improvement is useless. I cannot tell; but certain it is, that experimental improvement has been made, and a great saving in coals obtained; and instead of the slovenly way now used in building a kiln, cheapness in labour is only considered. That this labour ought to be done in the most strong and substantial manner, there is no doubt; for it is well known that fire, as well as water, requires the greatest strength and solidity; and five pounds or more would be well laid out in extra labour, in building a large kiln upon a proper principle. The form or figure of the kiln should also be altered. The segment of an egg in the direction of its axis is the best form for a kiln: its base ten feet, and height twelve feet, or even fourteen feet, will burn 150 bushels of lime every twenty-four hours (but it may be built larger in the above proportion), and consumes, according to the hardness of the chalk, one bushel of coals to four or five of lime; but breeze (cinder ashes) mixed with coals will go further, and answer better than all coals, for the coals of themselves will run and cake, unless continually opened and stirred for the air to get through, but breeze mixed with them will prevent it; and this is the reason why breeze is preferred to coals in burning of bricks in a clamp, for the slag or iron ore in the coals unites the bricks into a lump, which cannot be separated without great force by iron crows, spoiling the shape and form of the brick.

"Three or four courses of bricks should be curved or drawn inwards at the top, to check the fire, which will have the effect of preventing the fire escaping at the top, without performing its duty of burning the stone or chalk; for this is the reason why the lime is in general not so well burnt at the top as elsewhere, especially at the sides.

"The weight of a bushel of well-burnt lime-stones is from thirty-six to thirty-eight pounds; but if laid by twelve hours, it partly slacks itself, and will be nearly sixty pounds weight.

"The second kind of lime I shall mention is Lord Stanhope's, at Cratham, near Bromley, in

Kent, and here, perhaps, I have a just right to beg his lordship's pardon for attempting to annul or describe the goodness or quality of a lime lately brought into use, and on a plan quite different to any in this country heretofore; a patent having been obtained by his lordship for a particular way in burning it, so that a proper information of this new manufacture, but lately introduced into the building branch, cannot by me be ascertained. I saw some in Greenwich, in February, 1802; it slacked well, and had all the appearance of the qualities requisite for good lime, being in large stones and exceeding light, and also well burnt; but whether fit for water-works or not, time only will discover. Its gravity is thirty-two to thirty-four pounds per bushel.

"Third kind.—Dorking stone lime. This, with the Ryegate stone lime, is on an equal footing, although attempts have been made to prefer the latter. This stone is only chalk a small degree harder than the first-mentioned, and wants more fire, and is generally burnt in a cone kiln, built elliptical and low, for what reason my small judgment cannot find out; nor could either the proprietor or the burner give me a sufficient reason why that is the best form, to induce me to come into their way of thinking. I beg leave to observe that the kilns without cones would burn the lime as well for present use. This lime is supposed (but I never knew it proved) to stand the frost and the frowns of winter, and also for water-works, much preferable to common lime. That it is preferable to it is without doubt, but not equal to the extra price; nor does it brave the winter without injury, where it is exposed nearly equal with common lime. The weight is, per bushel, about forty-six to fifty-nine pounds.

"Fourth kind.—Guildford stone lime. This being still the same stratum of stone as the Ryegate and Dorking, lying in the same range of hills, is but very little harder and burns more yellow, but whether more durable is difficult to ascertain. Too much praise cannot be given to the proprietor of this stone for attending personally at the kilns at the London Docks, in the Isle of Dogs, to see it properly burnt. But, notwithstanding the superior knowledge and abilities of the engineers and surveyors, I cannot be brought to believe that grinding it is superior to slacking it properly. I do not recollect reading that any of the ancients made use of that method in any of the famous structures time has permitted to remain as models for the admiration of modern artists. I well remember as to their being particular as to the water for slacking and making up, to the right time of the year, and length of time to lie before it should be used, and also to its burning, but not a syllable about grinding it; and one reason against it, amongst many others, is, that if the lime is only half burnt, by grinding it cannot be discovered, which by slacking is disclosed immediately; and this chiefly convinces me that the brickwork done in the summer of 1801, in the large dock, the joists, a great part of the way up, were drawn out by the frost, and obliged to be pointed. If so little frost as there was that year has had such an effect, what would a severe winter do? Now, with submission to better judgment, instead of pointing it with the same lime as the bricks were laid in, it should have been done with the best Welsh stone burnt lime, mixed with the clinkers of a furnace (or slag) ground and sifted very fine, which is the best cement for water, unless when the best real Dutch terras is to be got—that only is preferable. Another reason for slacking the lime, is the many large stones in this, as well as the Dorking lime, that remain unburnt, which will discover themselves in the slacking, but not in the grinding. Some of the stones are put into the kiln so large, that they are not burnt through, and leave the middle of them as unburnt as ever, when the smaller stones are burnt to powder. The weight of a bushel of this lime is from forty-eight to fifty-six pounds, which is proof sufficient that it is not enough burnt.

"Fifth kind.—Shell lime. This lime is seldom burnt or used in England, except in some places on the sea-coast, where chalk or stone is scarce. It was used at first by Mr. Smeaton, F.R.S., Engineer to the building of Ramsgate pier, and esteemed by him a most excellent cement; but he afterwards found a better in the Welsh stone, from Glamorganshire, but that coming very expensive, Mr. Smeaton continued to use the shell lime for backing in, and the Welsh lime for setting the fronts only. Shells make a very good and durable lime, and it is to be lamented that it is not more in use in England. In America, all along the sea-coast, no other kind of lime is used, and the shells are in such amazing abundance on Charlestown Bar, South Carolina, that I have seen from thirty to fifty carts and waggons loading with shells at a time, at low water, and the next tide would bring up as many more; and, if they were taken away, would be repeated, and so on successively. The weight I never remember to have heard. It wants no screening, and has much of the quality and appearance of the Dutch terras.

"I am informed, that in Persia, and many provinces in the East Indies, especially on the sea-coasts, no other lime is made but of shells.

"Sixth kind.—Kentish rag-stone. The lime that is burnt of this stone is an exceeding strong and good cement; it burns brown, and is by much the strongest and best lime made of any English stone, being very hard and heavy, and solid as Parboek or Portland. The stones must be broken in pieces, not so large as a man's fist, and burnt in a kiln with a cone chimney or vent, from twenty to thirty feet high. The only place where this lime is burnt, near London, is at Nine Elms, near Vauxhall, and sold at two shillings and fourpence per bushel, which generally weighs about ninety-four pounds.

"This lime is in great request, for its great strength, with the sugar-bakers and soap-makers, and also for water-works; a great deal is sent to the West Indies in hogheads and other casks. The kilns are in general three feet in diameter at the bottom, ten feet diameter at top, and twelve feet deep, which will burn one hundred and fifty bushels of lime every thirty-six to forty-eight hours, when the fire must be let out to cool.

"Seventh kind.—Plymouth stone lime. This is a dirty blue stone, and is broke and burnt in kilns just in the same manner as the former, and at the same place. This stone burns to a beautiful white lime, but it has not the strength of the former, although in general used in all the purposes of the other. The weight of a bushel of this lime is about eighty-six pounds.

"Eighth kind.—Welsh stone lime. This stone comes from Cardiff or Aberthaw, in Glamorganshire. This Mr. Smeaton, the famous engineer, and F.R.S. (who, among other great works, erected the Eddystone Lighthouse), calls the best of lime; and, from his long experience and great knowledge in the many great works he has built, no doubt can be entertained of his veracity; his treatise on the Eddystone Lighthouse, and the great care he took to get the best mortar or cement in that most difficult undertaking, proves that the minutest parts of the great whole did not escape his penetration, and the success in finishing that very dangerous work proves his great judgment and sagacity.

"I think Mr. Smeaton says, the Welsh stone, to burn it properly, will take sixty hours with a good fire, and will lose about one-third of its weight in burning; but as he does not mention its being broke to burn, we must suppose it to be put in the kiln in the lumps as they rise, which are often fifty to seventy pounds weight or more. With due submission to so great a judge, we may believe, if the stones were broken as the Kentish rag or Plymouth stone, which is, I think, as hard, I should think forty to forty-eight hours, with a good fire, would burn a kiln off well of good lime; but ninety in burning from the same stone need not be observed.

"As lime may be made of different materials, such as chalk, shells, and different kinds of stone, it must be observed, that the harder the materials the better the lime, which makes the stone lime to be preferable, and of that the harder the better. In England, the red, or bluish stone is the best; in Italy, marble is cheap and plentiful, and they make of it a most excellent lime.

"Every stone that will ferment with acid, such as aqua fortis, will make good lime, and the more round and solid the better, which makes the Welsh stone preferred; but where the stone comes from a rock, or bed, let it not lie long in the open air before it is burnt, for it loses much in lying above-ground; and also use it as soon as possible when burnt, for its loss by keeping and exposure to the air is incalculable. The lighter the lime the better: the best takes the most water to slack it: the more it smokes the better it is; and if slacked in a tub, the more it sticks to the sides the better the lime."

TO THE EDITOR OF THE BUILDER.

SIR,—Permit me to inquire, whether it is your intention to devote the pages of THE BUILDER solely to the advancement of structural science,—or whether you purpose also to admit essays on antiquarian subjects? If it be your earnest desire to spread abroad a more perfect knowledge of the admirable works of our forefathers, by what means could you better accomplish it than by instilling a love and veneration for the principles that guided those by whom they were erected? True it is, that the spirit of the olden time has departed, or we should not constantly witness those painful caricatures of ecclesiastical edifices that everywhere abound. Until this spirit is re-established, our buildings can be but cold imitations, without the life, of our ancestors' nobler works.

The task, indeed, is difficult to combat with the sordid feeling of the age, and to inspire generosity and unanimity—yet it is not impossible—a brighter sun is arising amongst us, to shed its light and radiance on our darkened minds—the gloom is everywhere dispersing, and if your correspon-